

I claim:

1. Improved gingival retraction devices, comprising a structural backing component which transmits simultaneous circumferential vertical forces to insert gingival retraction material into the gingival crevice.
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2. The improved gingival retraction devices of claim 1, wherein the structural backing component is of malleable composition.
- 10 3. The improved gingival retraction devices of claim 1, wherein the structural backing component is of a resilient or flexible composition.
4. The improved gingival retraction devices of claim 1, wherein the retraction material is integrally attached to the structural backing component at the time of manufacture.
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5. The improved gingival retraction devices of claim 1, wherein the retraction material is manually applied to the structural backing component by the end-user.
6. The improved gingival retraction devices of claim 4, wherein the structural backing component transmits vertical forces to the integrally attached retractive material to effectively insert the retraction material into the gingival sulcus.
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7. The improved gingival retraction devices of claim 4, wherein the integral attachment of these two components eliminates undesirable axial or circumferential tensile displacing forces, thereby making insertion of the improved retraction devices easier and more predictable for the end-user.
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8. The improved gingival retraction devices of claim 1, wherein the retraction devices is of a form selected from the group consisting of shells or domes, cylindrical bands, rings, organic crown forms, linear tape form, or rod forms.
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9. The malleable improved gingival retraction devices of claim 2, wherein the structural backing component comprises a malleable metal selected from the group comprising aluminum, copper, brass, tin, and gold, alloy of such metals, and malleable plastics or composites.
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10. The gingival retraction shells of claim 5, wherein the shells are filled with a retraction putty, paste, or gel for the application of a viscous hydrostatic mechanism of gingival retraction.
- 10 11. The gingival retraction shells of claim 1, wherein the gingival retraction shells are manufactured with integrally applied hemostatic or vasoconstrictive agents to promote the cessation of bleeding.
- 15 12. The method of adjusting and adapting the improved malleable gingival retraction devices of claim 2, wherein the size, form and contours of the devices are altered by a clinician to customize the fit of the devices so that they insert precisely in the gingival crevice of a tooth .
- 20 13. The method of claim 12, further comprising plastic frustoconical dies and wherein the clinician increases the circumferential diameter of the opening of the soft, malleable material of the shell, band, or ring by forcing it over the plastic frustoconical dies.
14. The method of claim 12, wherein the clinician further increases the circumferential opening by forcing the shell over the prepared tooth.
- 25 15. The method of claim 12, further comprising a hand forceps and wherein the clinician bends or crimps the shells with hand pressure by using the crimping forceps to decrease the external circumference or to alter the contours of the margin of the shells.

16. The method of claim 12, further comprising a scissors and wherein the clinician cuts or trims the soft metal of the margins on the shells with the scissors in order to adapt the margins of the malleable shells to parallel the contours of depth of the gingival sulcus.
- 5 17. The malleable gingival retraction shells of claim 2, wherein the malleable material is sufficiently malleable to be adapted by finger pressure while being sufficiently rigid to transmit vertical forces required to insert the retraction devices into the gingival sulcus without collapsing or buckling.
- 10 18. The flexible gingival retraction devices of claim 3, wherein the structural backing component comprises a flexible plastic, Mylar, or composite which retains flexibility and adaptability while being sufficiently rigid to withstand the vertical forces required to insert the retraction device into the gingival sulcus.
- 15 19. The gingival retraction devices of claim 4, further comprising a structural backing component and wherein the retraction material is integrally attached to the outer surface of the structural backing component or alternatively to both the inner and outer surface of the structural backing component.
- 20 20. The gingival retraction devices of claim 4, wherein the retraction material comprises a porous fabric, mesh, or foam material of non-woven or woven, natural or synthetic composition which mechanically retracts the gingival tissues laterally away from the tooth.
- 25 21. The gingival retraction devices of claim 4, wherein the retraction material comprises a superabsorbent hydrogel which absorbs water and bodily fluids and undergoes a chemico-mechanical volume expansion which retracts the gingival tissues laterally away from the tooth.
- 30 22. The gingival retraction devices of claim 11, wherein the hemostatic agents minimize or eliminate blood flow to the gingival tissues.

23. The improved gingival retraction devices of claim 1, further comprising impression material applied to the malleable shells or bands to form individual die impressions of single teeth that may be used as impression copings of an arch impression.
- 5 24. The alternative application of gingival retraction shells of claim 23, further comprising a porous fabric or mesh material and wherein the porous fabric or mesh material forms a micro-mechanical attachment with the impression material upon polymerization of the impression material.
- 10 25. The method of claim 12, further comprising manual application of retraction resin or alternatively impression material to the inside of the shell and seating of the shell over the prepared tooth with vertical force which forces the gingival retraction material or impression material into the depths of the gingival sulcus by generating hydrostatic pressure.
- 15 26. The method of claim 12, further comprising injection of gingival retraction resin or alternatively impression material into the shell through a hole in the top of the shell with a syringe engaging the hole to create additional hydrostatic pressure within the shell to flush fluids and debris out of the gingival crevice and to force retraction material or impression material into the depths of the gingival crevice by generating hydrostatic pressure.
- 20 27. The gingival retraction devices of claim 21, wherein the hydrogel comprises either a single polymer network or a co-polymer.
28. The gingival retraction devices of claim 21, wherein the hydrogel comprises a mat
25 layer attached to the structural backing component without an external porous membrane or alternatively a mat or gel with an external porous membrane.
29. The gingival retraction devices of claim 21, wherein the rate of absorption and
expansion may be controlled by either the degree of cross-linking if a co-polymer is utilized,
30 or by another function of the chemical reaction, or alternatively by the pore size of an external membrane.

30. An alternative embodiment of the linear tape form of gingival retraction tape in which the tape is sectioned in a manner in which the functional retractive surface of the tape may be adapted to horizontal convexities and concavities of the gingival crevice quickly with finger pressure, instead of trimming the tape with a scissors.
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